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The making of an Aerotropolis – China’s Zhengzhou Airport

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In less than a decade, CGO has developed from a modest, domestically focused airport with Foxconn serving as its industrial anchor into a Tier 1 international airport and global air logistics hub alongside a thriving 415 sq km economic zone, reports John D. Kasarda, PhD

An amazing story in air logistics and ‘aerotropolis’ development is playing out in Zhengzhou, the capital of Henan Province, central China’s most populous, a little over an hour’s flight time from Beijing and Shanghai. I initially got to know about Zhengzhou in 2010, researching its recruitment of Foxconn – Apple’s largest subcontractor – for a massive 200,000-worker iPhone assembly complex adjacent to Zhengzhou Xinzheng International Airport (CGO), 25 kilometres southeast of the downtown.

My first visit to Zhengzhou was in 2012 when municipal leaders invited me to prepare a strategic roadmap to help transform the area around CGO into an Aerotropolis, with Foxconn serving as its industrial anchor. Succinctly defined, an Aerotropolis is an airport-centered urban economic region that rapidly connects high-end manufacturers and business services to their global suppliers, mar-



Foxconn’s massive 200,000-worker iPhone assembly complex adjacent to CGO served as ‘an industrial anchor’ to help transform the area around CGO into an Aerotropolis

ketplaces, and enterprise partners. It represents an amalgam of international airport, multimodal logistics hub, and modern business/industrial complex offering time-critical, high-value enterprises

speed, agility, and connectivity to compete more effectively in today’s turbulent, fast-paced, globally networked economy. (See www.aerotropolis.com)

What I witnessed in 2012 was far from

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The ZAEZ Smartphone Park. Approximately 1.35 billion smartphones were produced in the ZAEZ last year, including 900 million by Foxconn

this description. Rather, the 415 square kilometre aerotropolis area that now constitutes the Zhengzhou Airport Economy Zone (ZAEZ) consisted primarily of a modest, domestically focused airport with scatterings of small, impoverished villages tied to subsistence agriculture.

Today, CGO is a Tier 1 international airport and global air logistics hub. It is among Asia's fastest-growing airports, driving a surrounding 21st-century manufacturing powerhouse and export dynamo as well as a modern Aerotropolis that was envisioned by China's State Council when it formally established the ZAEZ in March 2013 as a national strategy. I feel fortunate to have been associated with the ZAEZ since its establishment as its Chief Advisor to witness first-hand its (and CGO's) remarkable growth over the past eight years, key components of which this article highlights.

CGO's aeronautical engine

CGO now offers 194 passenger aircraft

routes (including 27 international), along with 51 cargo aircraft routes, 41 international – the latter connecting the airport and ZAEZ to 16 of the world's 20 top air cargo markets. Its aviation infrastructure consists of one 3,600m 4-F runway and one 3,400m 4-F runway, two passenger terminals with 133 aircraft stands, and seven cargo terminals covering over 140,000 sqm. This gives CGO a current passenger capacity of 40 million annually and cargo capacity exceeding 700,000 tonnes. Passenger Terminal 2, which opened in 2016, has a multimodal ground transport centre directly underneath it for intercity trains, subways, bus, and taxis.

During seven of the past eight years, CGO was China's fastest-growing airport in percent increases of cargo volume and among its leaders in percent growth of passenger volumes. In Covid-impacted 2020, the airport handled 21.4 million passengers (down from 29.4 million in 2019) and 640,000 metric tonnes of cargo (up from 522,000 tonnes in 2019). Data through

October 2021 suggest that CGO's cargo will increase at least another 15% in 2021, with international cargo representing 77% of shipments. CGO currently ranks sixth in cargo volume among China's 200+ civil airports and 38th worldwide.

Air Silk Road

Fueling its cargo growth has been ZAEZ's attraction of many additional smartphone assemblers besides Foxconn along with other aviation-oriented industries such as biomedicine, cross-border e-commerce, food perishables, and suppliers of aircraft and ICT components. Moreover, in a June 2017 meeting with Luxembourg Prime Minister Xavier Bettel, China's President Xi Jinping initiated an 'Air Silk Road' dual cargo hub strategy, with CGO serving as the hub for the Asia-Pacific region and Luxembourg for Europe and the Americas. In 2020 alone, Luxembourg's Cargolux Airline, which is 35% owned by the Henan Civil Aviation Development & Investment Co, transported 128,500

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Threat Detection through Electromagnetics



As chief advisor to the ZAEZ, Kasarda has witnessed first-hand its – and CGO’s – remarkable growth over the past eight years

tonnes of cargo to and from CGO, making Cargolux the most significant freighter airline connecting China with Europe and the rest of the world.

Diverse cargo terminals

The seven terminals handling CGO’s cargo are diverse. One is dedicated to international express cargo and mail and a second to general overseas cargo. Others include a dedicated airside cold chain cargo terminal and one for pharmaceuticals and medicines that possesses GDP (Good Distribution Practice) certification meeting the most stringent World Health Organization standards for safety, security, and handling of pharmaceutical and medical products. Terminals focusing primarily on various types of domestic cargo round out the seven.

With CGO’s cargo volumes growing so rapidly, plans are to develop a new cargo area by 2030 which will raise capacity to 2 million tonnes annually. This includes constructing the fourth-largest China Post air-mail handling center and distribution port

after Beijing, Shanghai and Guangzhou. SF Express (China’s major integrator) has also signed a strategic cooperative agreement to develop a dedicated express cargo facility and to explore air-rail cargo synergies between this facility and the new ZAEZ high-speed rail station – one of the largest in China – that opened approximately 6 km southeast of CGO in late 2021.

Cargo expansion plans

Plans are to construct third and fourth runways and a third passenger terminal as demand warrants. CGO’s cargo terminals will also be substantially expanded, bringing ultimate cargo capacity to 5 million tonnes annually.

To speed cargo throughput, CGO is fully digitalising under its e-freight programme. PDAs are used throughout the entire goods handling process to optimise efficiencies and minimise transfer time and cost. Freight forwarders and 3PLs utilise ‘single window’ electronic documentation platforms, as well. The outcome is that CGO offers Customs clearance times

at least five times faster than the national average for both imports and exports. For time-critical goods and temperature-sensitive products, CGO has established a fast-track (green) channel allowing pre-clearance of advance electronic declarations, along with rapid cargo inspection and release upon arrival.

Comprehensive Bonded Zone

To further accelerate international shipments while reducing taxes and bureaucratic costs, CGO has one of China’s busiest and best performing comprehensive bonded zones. This 5.1 sq km bonded zone, which spills into the ZAEZ, functions essentially as a Free Trade Zone for taxation/bureaucratic minimisation and ease of cross-border financial transactions, where accounts can be settled in any foreign currency.

The immense Foxconn iPhone complex is situated in this Comprehensive Bonded Zone, from which nearly two-thirds of all new iPhones shipped around the world originate. The zone’s imports and exports, dominated by smartphones and their components, reached ¥410 billion (US\$64.2 billion) in 2020, a year-on-year increase of 18.5%, accounting for over 60% of the value of all Henan Province trade. The zone, operating 24/7, is consistently ranked in China’s top three comprehensive bonded zones in annual trade value.

Air transported food and medical products constitute two of its fastest-growing cargo sectors. Reinforcing the bonded zone, CGO contains three significant ports handling food perishables – fresh fruits, chilled aquatic product imports, and live aquatic imports – that serve all central China. In addition, there is a large port for medical goods imports and exports as well as one for international mail transit. Two further food ports – live animals and fresh meat – are located, respectively, in the north and south portions of the ZAEZ.

Rapid e-commerce growth

Other major activities in the comprehensive bonded zone include cross-border e-commerce, commodities display, international aircraft financing and leasing, kitting, supply-chain sequencing, and

value-added logistics such as labeling, packaging and testing. Its cross-border e-commerce sector processed 139 million orders in 2020, constituting a total value of ¥11.4 billion (US\$1.8 billion), a 62% year-to-year increase. In 2020, 84 cross-border e-commerce companies newly registered in the bonded zone, bringing its total to 804.

CGO and the Comprehensive Bonded Zone have leveraged considerable aviation-oriented business and industrial development throughout the 415 sq km aerotropolis area. This includes more than 300 major investments by firms in the past five years and over 1,000 smaller ventures

The greatest growth has been in ZAEZ's ICT sectors. At least 200 smart electronics enterprises have complemented Foxconn's presence cumulatively, producing nearly a half million mobile phones a day generating an output value exceeding ¥320 billion (US\$50 billion) in 2020. Approximately 1.35 billion smart phones were produced in the ZAEZ that year, including 900 million of them by Foxconn.



Cargolux transported 128,500 tonnes of cargo to and from CGO in 2020

Smartphone value chain

Recent years have seen the ZAEZ attract the entire smartphone value chain including the manufacturing of chips, modules, panels, and liquid crystal displays. The southern portion of the ZAEZ (rather

than the Comprehensive Bonded Zone at its core) has been where most of the new smart electronics enterprises have been locating. The largest concentration is in the Smart Terminal (Smartphone) Industrial Park with a floor area of 1.2 million



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The ZAEZ hosts a rapidly expanding biomedicine sector in one of several sector-specific industrial parks

sqm. This park has five zones: Zone A primarily for mobile phone manufacturing; Zones B and C for research and design of smartphone products and software; Zones D and E for optical displays including panels, modules, silicon substrates, and liquid crystal displays.

ICT value chain investment is reinforced at the Optical Display Industrial Park covering an area of 342,400 sqm. Along with a range of optoelectronics, firms in the park produce smart terminals, tablets, and personal computers. In addition, Wafer Works (Zhengzhou), the world's sixth largest producer of silicon wafers, began operations in the ZAEZ in 2018. Phase 1 with ¥1.2 billion (US\$188 million) investment is producing 200mm wafers. The enterprise is currently ramping up to produce 300mm silicon wafers. And, in mid-2021, the 239,333 sqm Beidou Industrial Park began manufacturing smart terminal products such as

handsets, tablets, and mobile GIS platforms. Along with manufacturing, the Beidou Industrial Park does smart electronics testing and after-sales support.

The ZAEZ also hosts a rapidly expanding biomedicine sector. Primary here is the ¥10 billion (US\$1.6 billion) Zhengzhou Biomedical Industrial Park, which houses firms engaged in biotech and life sciences innovation and entrepreneurship as well as biopharmaceutical production. With major investment by the Henan provincial government, the park has a planned area of 1.3 sq km. Phase 1, with ¥2.5 billion (US\$391 million) already invested in facilities with a floor area of 506,000 sqm, has companies involved with modern Chinese medicines and medical equipment as well as in exploring new ways that traditional Chinese medicines can be applied to treat a variety of contemporary diseases.

New-generation vehicles

Intelligent Connect Vehicles (ICV) and New Energy Vehicles (NEV) are among the most recent sectors developing in the ZAEZ. Focus is on production of new energy batteries, on-board electronics, and intelligent driving devices.

In addition to high-end manufacturing, the ZAEZ offers a plethora of aviation, business, and urban support services. The first aviation training centre in central China was put into operation in June 2020 in the ZAEZ's southern portion. The 50,000 sqm facility is set up to eventually train 2,000 pilots and 3,000 air traffic controllers annually.

The Zhengzhou New International Convention and Exhibition Center (ZNICEC), one of the largest in China, is scheduled to commence operation in late 2022. Constructed 2 km from ZAEZ's high-speed rail station at a cost of ¥10

billion (US\$1.6 billion), the ZNICEC covers 1.6 sq km with a total exhibition area of 625,333 sqm. The complex will serve as a magnet for companies throughout China and the world to come together to display new and innovative products. An entire MICE industry services support ecosystem is evolving around the ZNICEC including hotels for attendees.

New urban districts

Two urban districts are under construction in the southern and eastern portions of the ZAEZ. One is the Shuanghe Lake Sci-Tech City around an attractive man-made lake. Here, office campuses are being developed for high-tech R&D and advanced business services. The urban district will also contain quality residential areas, shopping, hospitals, and international schools to attract talent as well as a public park and cultural zone. A second urban district is being planned near the ZAEZ's new high-speed rail station that will contain the full complement of urban

and commercial services.

To capitalize on high-speed freight trains that will be operational in China in the coming years, a high-speed rail logistics park is likewise being planned near the high-speed rail station. This logistics park will specialise in the distribution of time-sensitive smaller parcels including B2C e-commerce shipments. Plans include linking the high-speed rail logistics park to CGO's cargo area to foster air cargo-high-speed freight rail synergies.

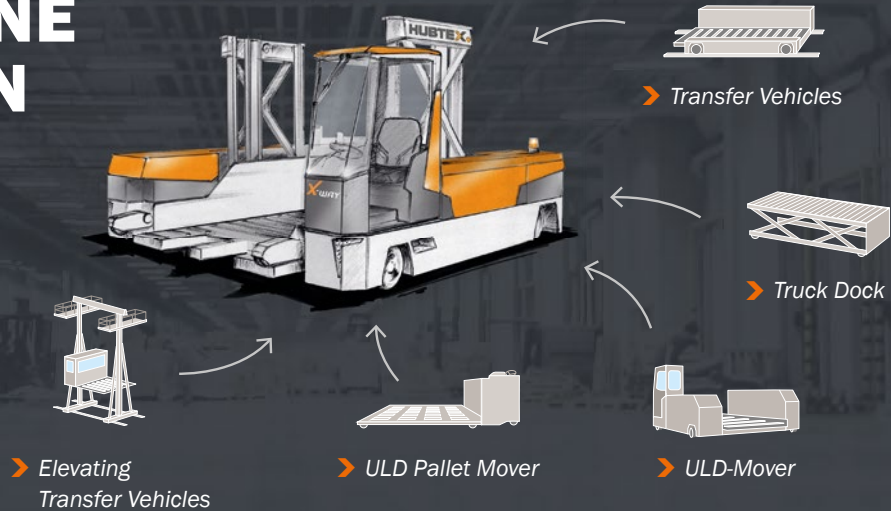
What makes the ZAEZ an exemplary aerotropolis is the way its planners and administrators have successfully integrated aviation, surface transportation, logistics, and urban objectives to create speed, agility, connectivity, and livability. Achievement of these four aerotropolis objectives is why many – including China's People's Daily – refer to the ZAEZ as "China's Aerotropolis".

Dr. John D. Kasarda is president of the Aerotropolis Institute China and a faculty member at the University of North Carolina's Kenan-Flagler Business School (USA) ■



Dr. John D. Kasarda

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